

A Robust Flare Planning Logic for Unmanned Aerial Vehicle Applications, Phase I

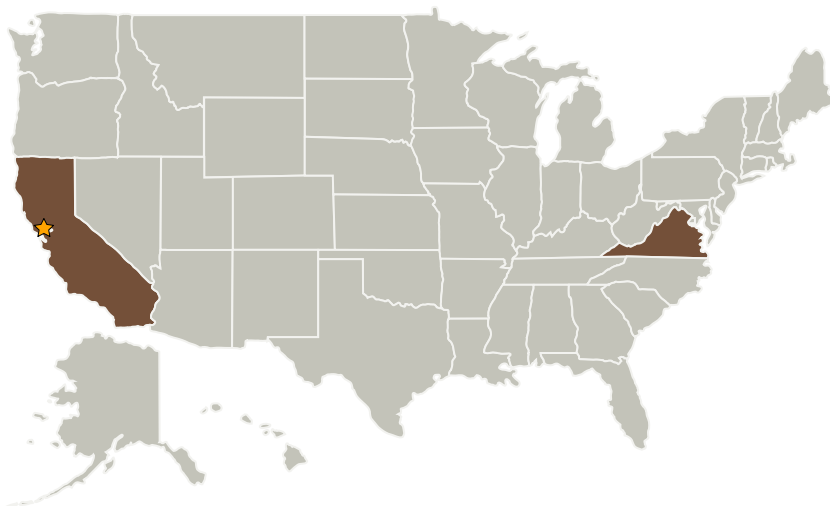
Completed Technology Project (2009 - 2009)



Project Introduction

Aurora Flight Sciences proposes to develop a flare planning logic that would provide aircraft guidance during this critical phase of flight. The algorithms that Aurora seeks to leverage address the reachability problem in the fields of Optimal Control and Hybrid Systems. Two competing technical approaches will be considered; Aurora collectively refers to them as "Safety Verification-based algorithms." To this end, Aurora proposes the innovation of applying a suitable version of these algorithms to the design of a flare maneuver guidance and planning logic. The planner will be capable of dynamically producing a flare maneuver guaranteed not to violate the aircraft flight envelope and other stipulated constraints. The planner will meet the robustness requirements stipulated in the topic solicitation; namely, it will apply to both impeded and unimpeded aircraft, and it will operate under significant weather disturbances. The main technical challenge in developing the planning logic is extending and applying the chosen control algorithms to 6-DOF aircraft dynamics models under the required variety of operating conditions. The ultimate goal of the Phase 1 effort is to explore the feasibility of applying Safety Verification-based optimal control algorithms to an appropriately sophisticated model of the aircraft dynamics during the flare maneuver.

Primary U.S. Work Locations and Key Partners



A Robust Flare Planning Logic for Unmanned Aerial Vehicle Applications, Phase I

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

A Robust Flare Planning Logic for Unmanned Aerial Vehicle Applications, Phase I

Completed Technology Project (2009 - 2009)



Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Aurora Flight Sciences Corporation	Supporting Organization	Industry	Cambridge, Massachusetts

Primary U.S. Work Locations

California	Virginia
------------	----------

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
 - └ TX17.1 Guidance and Targeting Algorithms
 - └ TX17.1.1 Guidance Algorithms